Wisconsin
Department of Commerce

Evaluation # 200315-G (Replaces 200109-G) Revised

Safety & Buildings Division
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Wisconsin
Building Products Evaluation

Material	Pyroscat® Fire Barrier Insulation Systems
Manufacturer	Thermal Ceramics P.O. Box 923 Augusta, GA 30903

SCOPE OF EVALUATION

GENERAL: This report evaluates the use of Pyroscat Fire Barrier Insulation Systems: Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps, and Pyroscat CSM Plenum Blanket. Pyroscat Fire Barrier Insulation Systems are manufactured by Thermal Ceramics.

This review includes the cited **International Building Code (IBC)** requirements below in accordance with the current **Wisconsin Amended IBC Code:**

As a method of reducing clearances to combustibles:
Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps have been evaluated as a method of reducing clearances to combustibles through a review of fire-resistance and through-penetration fire-stop testing.

As an alternative to a one-hour or two-hour fire-resistance rated shaft enclosure:
The approval evaluates Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps as an alternative to a one-, or two-hour fire-resistance rated shaft enclosure for commercial kitchen exhaust grease ducts, air ventilation or exhaust ducts, chemical exhaust ducts, egress pressurization ductwork, smoke evacuation ducts, and trash and linen chutes.

Fire Resistance Rated Construction:
- **Duct System:** the Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps were evaluated in accordance with the general requirements of **s. IBC 707** and may be used in lieu of a rated shaft.
- **Prescriptive Fire Resistance Assemblies:** the Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps were evaluated in accordance with the general requirements of **s. IBC 719.1**, **Table 719.1 (2)** and **Table 719.1 (3)**.

This review includes the cited **International Mechanical Code (IMC)** requirements below in accordance with the current **Wisconsin Amended IMC Code:**

Duct and plenum insulation:
The Pyroscat CSM Plenum Blanket has been evaluated as a non-combustible wrap material for use in plenums as a wrap on wire cables and plastic pipes (wet or dry condition), including drainage pipe.

- **Duct Enclosure:** the Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps were evaluated in accordance with the **s. IMC 506.3.11**.
- **Commercial Kitchen Hoods:** the Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps were evaluated in accordance with the general requirements of **s. IMC 507**.
- **Materials Exposed within Plenums:** The Pyroscat CSM Plenum Blanket was evaluated in accordance with the general requirements of **s. IMC 602.1**, **602.2.1**, **602.1.1** and **602.2.1.2**.

This review includes the cited **International Energy Conservation Code (IECC)** requirements below in accordance with the current **Wisconsin Amended IECC Code:**

As an alternative pipe insulation and vapor barrier:
The Pyroscat CSM Plenum Blanket (8 lb/ft^3 density, ½-inch thickness), and Pyroscat CSM Blanket have been evaluated for use as an alternative pipe insulation and vapor barrier.

- **Duct and Plenum Insulation and Sealing:** The Pyroscat CSM Plenum Blanket and Pyroscat CSM Blanket were evaluated in accordance with **s. IECC 803.2.8**.

DESCRIPTION AND USE

Thermal Ceramics Fire Barrier Insulation Systems feature its Pyroscat® listed and classified flexible fire barrier systems for commercial grease and air ductwork as an alternate to 1- and 2-hour Gypsum enclosures.

The full line of Pyroscat (fire barrier systems include duct wraps, blankets, bulks and boards) uses a special high temperature fiber composed of inorganic oxides using a proprietary spinning process to manufacture a flexible batt without the use of organic binders.

Pyroscat® FP Duct Wrap is a flexible, lightweight fire barrier system designed to provide one and two hour rated fire protection and zero clearance to combustible protection in grease and air duct applications. The system incorporates fire protection grade fiber blankets manufactured from inorganic oxides to form a needled blanket that is inherently fire resistant. Pyroscat® FP Duct Wrap is classified in three grades – F0 (unfaced), F1 (one side foil faced), and F2E (totally encapsulated).

Pyroscat® CSM Duct Wrap is made from a special High Temperature Fibrous Glass (amorphous wool) to yield a flexible, lightweight fire barrier system designed to provide one and two hour rated fire protection and zero clearance to combustible protection in grease and air duct applications. The system incorporates fire protection grade fiber blankets manufactured from a non-RCF composition (Calcia, Silica, and Magnesia), to form a needled blanket that is inherently fire resistant. Pyroscat® CSM FP Duct Wrap is classified in two grades – F1 (one side foil faced), and F2E (totally encapsulated).

Pyroscat® FP FASTR™ Duct Wrap is a flexible, lightweight fire barrier system designed to provide "faster" one and two hour rated fire protection and zero clearance to combustible protection at the overlaps in grease duct applications. The system incorporates fire protection grade fiber blankets manufactured from inorganic oxides, to form a needled blanket that is inherently fire resistant. Pyroscat® FP Duct Wrap is classified in three grades – F0 (unfaced), F1 (one side foil faced), and F2E (totally encapsulated).

Pyroscat® CSM FASTR™ Duct Wrap is made from a special High Temperature Fibrous Glass (amorphous wool) to yield a flexible, lightweight fire barrier system designed to provide "faster" one and two hour rated fire protection and zero clearance to combustible protection in grease duct applications. The system incorporates fire protection grade fiber blankets manufactured from a non-RCF composition (Calcia, Silica, and Magnesia), to form a

needled blanket that is inherently fire resistant. Pyroscat® CSM FASTR™ is classified in two grades – F1 (one side foil faced), and F2E (totally encapsulated).

Pyroscat® CSM Plenum Blanket is made from a special High Temperature Fibrous Glass (amorphous wool) to yield a flexible, lightweight fire barrier system designed to meet NFPA 90A Standards for Installation of Air Conditioning and Ventilating Systems. This standard specific to plenums (ceiling cavity and raised floor) requires that "all materials exposed to the airflow shall be noncombustible or limited combustible". The system incorporates fire protection grade fiber blankets manufactured from a non-RCF composition (Calcia, Silica, and Magnesia), to form a needled blanket that is inherently fire resistant. Pyroscat® CSM Plenum Blanket is classified in two grades – F1 (one side foil faced), and F2E (totally encapsulated).

Pyroscat CSM Plenum Blanket also provides thermal insulation in the thickness specified by ICC's International Energy Conservation Code. Pyroscat CSM Plenum Blanket is a ½-inch, 8 lb/ft^3 density product, and Pyroscat CSM Blanket available in a variety of thicknesses and densities. The aluminum foil facing and aluminum foil taping of the seams during installation seals the system and provides a vapor barrier.

TESTS AND RESULTS

Approved **Ventilation Duct** Assemblies, U.L. Design Assemblies: No. V-11,V-12 and V-14, see U.L. Building Materials Directory 2000.

Approved **Grease Duct** Assemblies, U.L. Design Assemblies: No. C-AJ-7018, C-AJ-7033, C-AJ-34, C-AJ-35, C-AJ-54, C-AJ-55, C-AJ-56 and W-L-7043.

Thermal Ceramics Fire Barrier Insulation Systems consisting of Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps, and CSM Plenum Blanket were tested:

- in accordance with ASTM E84 (UL 723), "Standard Test Method for Surface Burning Characteristics", submitted by Underwriter's Laboratories.
- in accordance with ASTM E814 (UL 1479), "Standard Test Method for Fire Tests of Through-Penetration Firestops", submitted by Underwriter's Laboratories.
- in accordance with ASTM E119 (UL 263, UBC 43-1, NFPA 251 and ANSI A2.1), "Standard Test Methods for Fire Tests of Building Construction Materials", submitted by Omega Point Laboratories, Underwriter's Laboratories, Inc., and Hughes Associates, Inc. Fire Science & Engineering.
- in accordance with, and Classified in accordance with ASTM E136 "Standard Test Method for the Behavior of Materials in a Vertical Tube Furnace at 750° C", data was submitted by Underwriter's Laboratories, Inc.
- Underwriter's Laboratories submitted data containing testing and labeling of the Pyroscat Fire Barrier Insulation Systems Plenum Blankets and Duct Wraps in accordance with UL 723 and ASTM E136, and Pyroscat Duct Wraps in accordance with UL 1978 "Standard For Grease Ducts.
- CSM Plenum Blanket was tested in accordance with UL 910, Test Method for Fire and Smoke Characteristics of Electrical and Optical Fiber Cables Used In Air Handling Spaces, and UL 1887, Fire Test of Sprinkler Pipe for Flame and Smoke Characteristics, by Omega Point Laboratories, Inc. See Report Number 15606-112695 and 15606-112697, respectively.

Approved **Plenum Protection Systems** Design No. PP 106P (UL 1887) and PP 107P (UL 910 / NFPA 262).

Combustibles in plenums: NFPA 90A Section 2-3.10.1 Ceiling Cavity Plenums and Section 2-3.10.5 Raised Floor Plenums. The basic requirement for materials permitted in plenums is in paragraph (a) which states:

"All materials exposed to the airflow shall be noncombustible or limited combustible and have a maximum smoke developed index of 50."

The definitions of noncombustible and limited combustible in NFPA 90A are based on the definitions developed originally by the American Insurance Association (formerly the National Board of Fire Underwriters).

The intent of the basic Sections 2-3.10.1 (a) and 2-3.10.5 (a) is to require materials, which have a low fuel contribution, should there be a fire in the plenum. It also will permit materials, such as wire and cable with combustible jackets in plenums provided they are completely enclosed in noncombustible or limited combustible material. The purpose of the enclosure is to shield the combustible material from the airflow in the plenum by encasing the combustible materials with a noncombustible material or a limited combustible material having a maximum smoke developed index of 50.

Thermal Ceramics has ceramic fiber insulation with or without facings designated **Pyroscat FP** and **CSM Duct Wrap/Pyroscat FP** and **CSM FastR Duct Wrap/Pyroscat FP** and **CSM Blanket**, which is classified as noncombustible. These products also have a flame spread rating of 0 and smoke developed rating of 0 when tested by UL Inc. under UL Standard 723 (ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials). This data was provided by Underwriter's Laboratories (UL) and Hughes Associates, Inc. Fire Science & Engineering.

Thermal Ceramics has a certified grease duct enclosure system using Pyroscat FP and CSM Duct Wrap, and Pyroscat FP and CSM FastR Duct Wrap. See Report No. R9242.

- ISO 6944, "Fire Resistance Tests – Ventilation Ducts," First Edition, International Organization for Standardization.
- Thermal Ceramic's Quality Assurance Manual is on file with the department.

LIMITATIONS OF APPROVAL

Thermal Ceramics Fire Barrier Insulation Systems consisting of Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps are approved as a method of reducing clearances to combustible materials to zero when constructed in accordance with this approval and the manufacturer's published installation recommendations.

Thermal Ceramics Fire Barrier Insulation Systems consisting of Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps are approved **alternatives** to a one-, or two-hour fire resistance rated shaft enclosures for **commercial kitchen grease** and **air ventilation ducts** when constructed in accordance with this approval and the manufacturer's installation recommendations.

Thermal Ceramics Pyroscat CSM Plenum Blanket and Pyroscat CSM Blanket is approved for use in plenums as a non-combustible enclosure material with a smoke developed index of less than 50.

Installation shall be by a qualified contractor in accordance with manufacturer's published instructions and referenced standards shall install the new or original Thermal Ceramics Fire Barrier Insulation Systems.

Multiple steel ducts in a single Thermal Ceramics Fire Barrier Insulation System enclosure is not permitted for commercial kitchen grease ducts. Multiple steel ducts in a single enclosure are permitted for air ventilation ducts.

The use of Thermal Ceramics Fire Barrier Insulation System enclosure components equipped with a drain nipple **was not evaluated in this approval.**

The **IMC** limitations below are in accordance with the current **Wisconsin Amended IMC Code:**

- **Ducts Serving Type I Hoods:** the duct shall comply with the requirements of **s. IMC 506.3.**
- **Joints and Seals:** of grease ducts shall comply with **s. IMC 506.3.3.**
- **Supports:** for grease ducts shall comply with **s. IMC 506.3.4.**
- **Clean-outs and Openings:** grease duct access doors shall comply with **s. IMC 506.3.9.**
- **Duct Enclosure:** Thermal Ceramics Fire Barrier Insulation Systems consisting of Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps comply with **s. IMC 506.3.11.**
- **Commercial Kitchen Hoods:** Thermal Ceramics Fire Barrier Insulation Systems consisting of Pyroscat FP, CSM, FP FastR, and CSM FastR Duct Wraps are allowed for use in accordance with the general requirements of **s. IMC 507.**

- **Materials Exposed within Plenums:** Thermal Ceramic's Pyroscat CSM Plenum Blanket complies with the requirements of **s. IMC 602.2.1.**

The **IECC** limitations below are in accordance with the current **Wisconsin Amended IECC Code:**

- **Duct and Plenum Insulation and Sealing:** The Pyroscat CSM Plenum Blanket and Pyroscat CSM Blanket complies with the requirements of **s. IECC 803.2.8**.

This approval will be valid through December 31, 2008, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions. The Wisconsin Building Product Evaluation number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document.

Revision Date: September 26, 2006
Approval Date: September 4, 2003 By: _____

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Product & Material Review
Integrated Services Bureau

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